Approved For Release 2004/11/30 : CIA-RDP78B04770A000800110021-0

SECRET

25X1

PAR 222

1 June 64

SUBJECT: Stereo Registration System

TASK/PROBLEM

1. Investigate possible means for automatically maintaining proper registration for stereo viewing on rear projection and direct viewing roll film viewers.

DISCUSSION

2. Work has progressed along two phases of action; the first phase was to investigate signal evaluation, and the second (still in progress) is the fabrication of the mechanical-optical breadboard.

a. Phase 1, Signal Evaluation:

(1) A preliminary signal study was completed in which an optical in-line breadboard was used for evaluation purposes. The test object was a 1 1/2 inch circular trace on the face of a 5ZP16 cathode ray tube. An 80mm f/2.8 lens was used to focus this circular trace onto a piece of film with 4:1 magnification. The breadboard also utilized collecting optics to pass the transmitted light beam onto the face of a 6291 photomultiplier tube.

(2) Initially, a 400 cps scan was used to generate the circular trace. Since all other power supplies operated from 60 cps line power, undesirable pickup occurred on the signal trace which was eliminated by going to a 60 cps scan. If faster scan rates are desired in the future, it is recommended that the scan signal be generated from a multiple of the line frequency.

GROUP-1
Excluded from automatic downgrading
and declassification

Declass Review by NGA.

SECRET

Approved For Release 2004/11/30 : CIA-RDP78B04770A000800110021-0

Approved For Release 2004/11/30 : CIA-RDP78B04770A000800110021-0

(3) Signal phasing was observed while varying the magnitude of one of the deflection yoke potentials. A 2 percent potential change which is equivalent to moving the film along one axis about 0.004 inch was easily noted on the signal.

(4) Spot size, which was estimated by scanning across a grid pattern, was studied to some degree. The minimum spot used approached 0.002-inch projected on the film and could only be attained with a very low intensity beam.

(5) The photo-multiplier signal is a composite of many frequencies. However, low-frequency density variations, density gradient signals, and high-frequency hash, which is a function of spot size, were the three major components of this signal.

(6) The P.M. tube signal was processed through an amplifier and a Schmitt trigger. Best results were obtained with severe filtering that removed low and high frequency components. Signal differentiation (removing low frequency) yielded a larger quantity of signal bits per scan and filtering out the high frequencies stabilized the Schmitt trigger cross-over point. This effect questions the use of a small spot size, and needs further investigation before a final conclusion can be reached.

b. Phase 2, Breadboard Fabrication:

(1) The main frame and lighttight box have been completed. The system will be mounted vertically and a single C.R.T. will generate the scan trace to eliminate balancing two traces.

(2) Portrait attachments in front of the 95-205mm f/6.3 zoom lenses will focus the trace onto the film. The attachments are required to put the object (trace) at its proper lens design conjugate.

(3) The film will be held between two glass plates. One piece will be fixed and the other will be mounted in a "Leitz" mechanical stage,

GROUP 1
Excluded from automatic downgrading
and declassification

Approved For Release 2004/11/30 : CIA-RDP78B04770A000800110021-0

which has 2 x 2-inch coordinates and 360-degree rotation. Micrometers adjust the X and Y axis to 0.0001 inch and rotation can be read to one minute.

(4) All of the optical hardware is on order and mounting brackets will be made for all optics except the C.R.T. which is mounted in a holder. One dichroic beam splitter was tested and proper filters selected to separate colors.

PLANNED ACTIVITY

3. The balance of the mechanical and optical components of the breadboard will be fabricated and assembled by 10 July. At that time, the two scan signals will be presented on a scope face for evaluation.

4. Design of the logic units for detecting magnitude and positional error will be initiated about 15 July.

GROUP-1
Excluded from automatic downgrading
and declassification

Approved For Release 2004/11/30 : CIA-RDP78B04770A000800110021-0